Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of	)	
	)	
Implementation of Section 17	)	
of the Cable Television	)	ET Docket No. 93-7
Consumer Protection and	)	
Competition Act of 1992	)	
	)	
Compatibility Between	)	
Cable Systems and Consumer	)	
Electronics Equipment	)	

COMMENTS OF SONY CORPORATION OF AMERICA

Craig J. Blakeley
Lee J. Tiedrich

Sidley & Austin
1722 Eye Street, N.W.
Washington, DC 20006
(202) 736-8000

Its Attorneys

March 22, 1993

047

TABLE OF CONTENTS

SUMMARY

[redacted]

believes that use of a decoder interface may warrant investigation as a longer term solution to the problem. However, Sony believes that broadband descrambling, which currently is under development, offers the most efficient and effective solution to the cable/CE compatibility problem -- at least in the present analog environment. Finally, in order to prevent the current "set top box" compatibility problems from being carried into the digital era, nationwide standards should be agreed upon for digital transmission, digital compression and digital encryption.

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

RECEIVED

with the relative costs and benefits of the various technological options for improving the compatibility between cable systems and consumer electronics. Sony also has had, and will to continue to have, discussions with individual cable operators, cable equipment suppliers, and CableLabs for the purpose of finding mutually agreeable methods to improve cable and consumer electronics compatibility.

I. BACKGROUND.

A. The Consumer Electronics Industry Has Made Voluntary Efforts to Achieve and Maintain Compatibility With Cable Television Service.

The consumer electronics ("CE") industry for years has been taking proactive steps to improve the performance and ease of the use of its products. In fact, the very existence and growth of the industry is based on providing consumers with products that offer the convenience, value, and features that they want. From the beginning of the cable television industry, consumer electronics manufacturers have made continuous efforts to make their products "cable friendly," as evidenced by the widespread availability of TVs and VCRs that have the ability to tune cable frequencies. Indeed, cable tuning ability was never legislated, or mandated by regulations, but it was demanded by U.S. consumers. The CE industry responded to that demand.

The CE industry has attempted to keep pace with the growing cable television industry in order to improve

compatibility between consumer electronics and cable systems. The initial cable television systems used only VHF channels. Since TVs and VCRs received VHF channels for off-air use, consumer electronics automatically were "cable compatible." As the cable systems expanded their program offerings, cable systems needed more channels. Cable systems first expanded into the "mid-band," a group of non-broadcast frequencies. CE manufacturers responded by offering the first TVs and VCRs with "cable tuners" that allowed the consumer to receive "mid-band" channels directly, rather than having to use a cable box. This was especially important for VCR time shifting applications, which required that the TV and VCR be tuned to two different channels at the same time.

Cable systems continued to expand their program offerings by adding "superband" frequencies. The CE equipment industry again responded by adding "superband" frequencies to cable tuners. Similarly, cable systems later began programming on "hyperband" frequencies. The CE industry once again responded by adding "hyperband" frequencies to cable tuners. Because the CE industry was able to respond to the expanding cable frequencies and there were nationally agreed-upon standards for those frequencies, both time shifting on cable and "cable compatibility" were possible for many consumers throughout the 1980's.

Toward the late 1980's and into the 1990's, signal theft and unauthorized use of service became very real concerns for cable systems, culminating in annual losses in unrealized revenue estimated by the cable industry to be substantial. NOI at ¶ 10 n.14. In order to curtail these losses, cable systems began scrambling or encrypting cable channels. However, various solutions have evolved to protect against signal theft. Unfortunately, no single scrambling approach is used consistently throughout the U.S. No standard, de facto or otherwise, has yet appeared. As a consequence, the "consumer friendliness" that previously was achieved between CE equipment and cable television has begun to break down; increasing numbers of consumers are finding themselves unable to fully utilize premium features that are built in to their home receivers and VCRs -- features that consumers desire to use and for which they have paid. The recently passed Cable Television Consumer Protection and Competition Act of 1992 ("Cable Act") is likely to increase cable systems' use of scrambling and addressable channels. The Cable Act, in part, requires cable systems to carry local broadcast

In order to preserve the value of consumer equipment enhancements and to provide the basis for additional improvements in the future, while protecting cable operators against unauthorized reception, Sony believes that it is important to encourage broadband descrambling, to preserve or standardize the present basic infra-red ("IR") cable box remote codes and to

control, the ability to watch one channel while recording another channel, the ability to make unattended recordings from different channels, picture-in-picture, and Channel Guide (Multiple Picture Scan).

Although cable boxes access only one channel at a time, most consumers today can enjoy some premium TV and VCR features because most cable systems still scramble only a few premium channels and pay-per-view channels ("PPV"). Because the majority of cable channels presently are not scrambled, it is still possible for the consumer to time shift, use PIP, etc., using the cable box to access the few scrambled channels and a splitter and A/B switch to access the remaining unscrambled channels. It has been only in the last year or so, that some cable systems have started scrambling most, or in some cases, all, channels. It is this step that has greatly complicated the use of TV and VCR premium features and increased the urgency for an immediate solution to the consumer electronics and cable compatibility problem.

1. Channel Change by Remote Control.

Remote controls cannot be used to change channels on TVs and VCRs that are connected to cable boxes. It may seem obvious, but it is a key point, that tuners in TVs and VCRs must be presented simultaneously with multiple channels in order to operate. When the "channel up" or "channel down" button is

activated on a remote control, the tuner in the TV or VCR changes the frequency that it receives, and tunes the new channel. This simple operation presupposes, and requires, that the tuner have more than one channel from which to choose. This is the case in broadcast television, where multiple channels are provided simultaneously to the TV or VCR antenna via VHF or UHF broadcasts. This is also the case for unscrambled cable channels that are provided to the TV or VCR directly by coax cable instead of by cable box.

However, a simple channel change by remote control becomes impossible when a cable converter/descrambler box is used because the converter/descrambler box provides as its output a single channel. Now when the channel up or down button is pushed on a remote control, the TV or VCR tunes to a new channel, but there is nothing there. All the other frequencies are blocked by the cable converter/descrambler.

2. VCR Time Shifting.

Cable boxes also deny consumers many of the benefits of VCR time shifting. VCR time shifting refers to the ability to watch one program, while simultaneously recording another program, or watching a program at a different time, and is the foundation of the popularity of the VCR. The reason that it is possible to watch one program on a TV, and record another program on a VCR, is because both the TV and VCR each have their own

separate tuners. Thus, the TV and VCR each can tune separate programs on separate channels. However, for the two tuners (TV and VCR) to tune separate channels, it is necessary that each tuner have access to multiple channels, so that the TV can tune one channel, while the VCR is tuned to another channel. Again, this is a very basic, but important, concept.

However, typical cable boxes provide only one output channel at a time, usually on channel 3. Thus, when a cable box is used, there is only one channel available for both the TV's tuner and the VCR's tuner, namely the channel that the cable box is tuned to, with the output on channel 3. Consequently, the TV and VCR tuners cannot be tuned to two different channels at the same time, because the cable box is supplying only one channel, and blocking all the other channels. Essentially, the two tuners in the TV and VCR have been "replaced" by the one cable box tuner. Since the cable box can tune only one channel at a time, it is not possible to watch one channel while recording another channel.

VCR time shifting capability can be partially restored by providing all unscrambled channels directly to the TV and VCR through a coax cable, thus bypassing the cable box. Bypassing the cable box provides some time shifting capability because the customer now can watch any unscrambled channel while recording another unscrambled channel. However, to watch a scrambled channel, the customer still must use a cable box. In addition,

the consumer now must lease or purchase a splitter and an A/B switch to switch between the unscrambled channels and the output of the cable box (the scrambled channels). To record a scrambled channel, the customer would need to lease or purchase a second splitter and A/B switch for the VCR, to switch between the unscrambled channels and the output of the cable box (the scrambled channels).

The time shifting problem becomes even more complicated when the customer wants to record one scrambled channel while watching another scrambled channel. In this case, the customer must have two cable boxes. One cable box functions as the TV's "tuner," while the other cable box functions as the VCR's "tuner." However, even with separate cable boxes for the TV and VCR, it still is not possible to make an unattended recording of two sequential scrambled channels because such a recording would necessitate an automatic channel change on the cable box.[1] Finally, if the VCR is connected to a TV that had picture-in-picture capabilities, the consumer would need a third cable box in order to time shift while using the PIP feature. See infra.

Although the use of multiple cable boxes, splitters and A/B switches may provide some time shifting capability, the issue

---

[1] Some cable boxes incorporate timers, similar to VCR timers, that allow the consumer to program a channel change in the cable box. However, given the well-documented difficulty that consumers have in programming their VCRs, requiring them to correctly program two devices in order to make one timed recording is not an attractive solution.

of cost and inconvenience to the consumer cannot be overlooked. The use of these complicated setups will require the consumer to rent or purchase multiple cable boxes which, in turn, will require more space than normally is needed in a typical TV/VCR setup. Similarly, the use of a TV/VCR setup that includes multiple cable boxes and perhaps multiple A/B switches may create more operational difficulties than the consumer had anticipated.

Finally, even assuming that a customer is able to time shift scrambled channels using a multiple cable box setup, the customer still cannot change TV channels by remote control. Most cable remote controls do not have the ability to address one specific cable box in a multiple cable box setup. As a result, if a customer uses a remote control to change channels on the "TV's cable box," the channel also would change on the "VCR's cable box," thus destroying the VCR recording.

3. Picture-in-Picture.

As with time shifting, a consumer's ability to enjoy Picture-in-Picture television ("PIP") is compromised substantially by the use of a cable box. PIP TV is a premium television feature that enables the consumer to watch two program sources at the same time. One program is displayed on the full television screen, while the other program is displayed in a "window," typically 1/8 the size of the full screen. Other

television receivers afford viewers the option of a "split screen" display -- two full height images, rather than a window.

Although there are different variations of PIP TVs, all

the TV/VCR setup, greater operational difficulties, and an inability to control two cable boxes separately by remote control.

Finally, it is not unusual today for cable subscribers to operate a PIP TV with one or two VCRs. Such combinations clearly cannot operate very effectively if the cable system scrambles a substantial portion of the channels, regardless of the number of splitters, A/B switches, and cable boxes.

4. Channel Guide (Multiple Picture Scan).

A consumer's ability to enjoy the Channel Guide feature also is substantially compromised by the use of a cable box. Channel Guide typically divides the television screen into 16 boxes and sequentially tunes 16 channels, putting a still picture from each channel in each of the 16 boxes. The entire Channel Guide process usually occurs in about 15 seconds. The purpose of Channel Guide is to give the consumer a quick impression of what programs are on a large number of channels, so that the consumer can quickly can select one.

Like remote channel change, VCR time shifting and PIP, for Channel Guide to function, the TV tuner must have simultaneous access to multiple channels in order to tune the channels in sequence. If a cable system scrambles a substantial number of channels, the only way for a TV to provide Channel

Guide would be for the TV to control the channel selection on the cable box. However, no TV currently has this capability.

5. Other Features.

Other features currently available in premium TV receivers include the ability to label (on-screen) the call letters of individual stations or networks. Another feature expected to be available soon is an electronic program guide which will list and summarize for the viewer the various program choices available on the cable channels to which the consumer has subscribed. Clearly, if the TV receiver is limited to receiving one channel from a converter/descrambler, such functions are rendered useless.

II. ALTHOUGH BROADBAND DESCRAMBLING APPEARS TO OFFER THE MOST EFFECTIVE SOLUTION TO THE CURRENT CABLE/CE COMPATIBILITY PROBLEMS, OTHER APPROACHES ALSO MERIT CONSIDERATION.

Sony believes that the most efficient and effective way to resolve current cable/CE compatibility issues is through broadband descrambling. This method, which currently is under development, would allow home consumer equipment to access multiple channels of descrambled programming, would maintain cable security, and would provide the optimum environment for utilization of the premium features in CE equipment discussed above. In addition, Sony believes that there are at least three other steps under active consideration by the cable and CE

industries that warrant discussion here: standardized IR codes; a standard wired control link to cable boxes; and a decoder interface of some type. In our view, standardized IR codes and a standard wired control, although not providing a complete solution to the compatibility problem, offer significant benefits and should be adopted and implemented. Decoder interface options also merit consideration. However, the drawbacks in terms of time for implementation, the necessary restrictions that their use would impose upon cable system operators, and the rapid development of digital transmission (which could render a decoder interface obsolete) limit the effectiveness of a decoder interface as a workable solution to current cable/CE compatibility problems.

A. The Cable Television/CE Equipment Interface Can Be Improved In The Near Future By Standardizing Cable IR Codes And Agreeing Upon A Cable Box Control Interface.

Accomplishment of two short-range objectives would improve significantly the compatibility between cable boxes and consumer electronics. First, cable operators and equipment manufacturers should agree to maintain and standardize the basic cable box IR codes. Second, cable operators and equipment manufacturers in cooperation with consumer electronics manufacturers should develop a standard wired control link to cable boxes.

1. Standardizing Basic Cable IR Codes.

At present, the IR remote control is the only existing "interface" between cable boxes and TVs or VCRs. Basic cable IR codes are the infra red ("IR") codes that control and change channels on cable boxes. In the past few years, CE manufacturers have programmed "universal" remotes, TV remotes, and some VCRs with the basic cable IR codes used in the most popular cable boxes. These remotes and VCRs thus can change channels or otherwise control most cable boxes by transmitting the same IR codes that would be transmitted by the cable box remote control. In fact, some VCRs introduced last year can use basic cable IR codes to change channels on cable boxes when a scheduled recording is about to begin. Additionally, several universal remote controls now are available that allow the customer to control the cable box, TV and VCR at the same time.

In order for consumers' IR remote controls to continue to operate cable boxes, the basic cable IR codes should be standardized or at least frozen.[2] There is currently no commitment to maintain existing basic cable IR codes. As a result, cable boxes with incompatible IR codes could be introduced, which would deny consumers the ability to control the cable box through their TVs and VCRs or "universal" remotes.

---

[2] Basic cable IR codes refers to the codes that control channel selection, such the numbers 0 through 9, channel up, and channel down. The remaining cable IR codes do not affect the channel selection and thus would not necessarily need to be standardized or maintained.

Although IR remote control currently serves as an important (and the only) interface between cable boxes and consumer electronics, IR remote control has certain limitations. VCRs and some timer devices rely on IR repeaters to change channels on cable boxes. However, the ability of the IR repeater to control the cable box may vary depending upon placement of the IR repeater and other factors.

In addition, some cable boxes do not have an "audio level preset" command. Consequently, a consumer could lower or mute the volume of a program and then make an unattended timer recording. The resulting recording would have no audio. Also, most cable boxes do not have discrete "ON" and "OFF" commands. As a result, a subscriber must make sure that the cable box remains on in order to make an unattended timer recording.

Finally, the effectiveness of IR remote control is reduced if the subscriber has multiple cable boxes. An IR remote control does not have the ability to address only one specific cable box in a multiple cable box set up. Thus, if a remote control is used to change the channel on one cable box, it automatically will change the channel on all the cable boxes.

2. <u>Standardized Wired Cable Box Control</u>.

Wired cable box control would function similarly to IR remote control, but would use a simple wire connection (e.g.

minijack) instead of an IR beam to send a control signal from the TV or VCR to the cable box. Like the IR remote control, wired cable box control would require a standard communications language between the cable box and the TV or VCR. The communication "language" could be the existing basic cable IR commands, transmitted by wire, instead of by IR signal or a simplified list of new commands determined jointly by the CE and cable industries. Because the control commands would be transmitted by wire instead of by IR beam, the commands would be less vulnerable to interference. Additionally, the command list could be expanded to include "audio pre-set" commands and discrete "ON" and "OFF" commands, which would enable consumers to make unattended VCR recordings with more confidence.

Wired cable box control would also allow two or more cable boxes to be controlled individually by TVs and VCRs. Although wired cable box control has not yet been developed, it could be designed relatively quickly, with cooperation from both the CE and cable industry, provided that the design goals are limited. Furthermore, wired cable box control could conceivably be applied to future "digital compression boxes" for future digital transmission systems until the development of digital transmission standards eliminates the need for such boxes.

3. Although Several Outstanding Issues Must be Resolved, Use of a Decoder Interface May Warrant Further Investigation as a Longer Term Solution.

Decoder interfaces have been tried in the past without success. In addition, the development of a decoder interface will require that restrictions be placed on cable systems' flexibility. Also the near term advent of digital transmission could render an analog decoder interface obsolete, possibly as soon as it is introduced. Nevertheless, decoder interface solutions bear investigation.

In the late 1980's, the CE and cable industries introduced Multiport in an attempt to resolve the compatibility problems caused by scrambling and encryption. The idea behind Multiport was that a multipin connector would be installed in the TV or VCR, capable of accepting a descrambler unit supplied by the cable system. The TV (or VCR) tuner would tune the channel, and the descrambler would descramble the channel. In fact, several companies manufactured TV sets with Multiport connectors for a number of years in the late 1980's. Indeed, several hundred thousand sets were made and sold. Unfortunately, few cable systems offered the descramblers that were necessary to operate Multiport. In addition, some scrambling techniques were developed that were incompatible with Multiport. For these reasons, the Multiport connector was abandoned.

A decoder interface would impose significant restrictions on cable operation. In order for such a system to work effectively in the long term, cable systems would have to agree to use only scrambling techniques compatible with the decoder interface. Moreover, cable operators would have to agree to preserve present analog channels (1 - 125) for analog use, if the decoder interface that was designed for use with analog cable systems was unable to accommodate digital transmission. Since a number of cable operators have announced their intentions to begin digital transmission as early as 1994, it is vital to address the analog/digital transmission issue in any discussions of a decoder interface.

B. Broadband Descrambling Is The Most Efficient and Effective Solution to the Cable/CE Compatibility Problem.

Although IR remote control and wired cable box control can improve the interface between cable and consumer electronics, both would require consumers to purchase or lease multiple cable boxes, splitters and A/B switches, when scrambling is used extensively. The best method for eliminating the need for cable boxes, and the inherent limitations that flow from use of cable boxes, would be through the development of broadband descrambling technology. Like wired cable box control, broadband descrambling is not yet commercially available. However, broadband descrambling potentially can protect investments in consumer electronics, provide addressability, eliminate the need for

multiple cable boxes and protect cable signals from theft and unauthorized use.

Broadband descrambling would allow cable operators to scramble some or all of the channels. An authorized channel would be received and simultaneously descrambled by a single addressable box at the consumer's home.[3] All of the channels then would be fed simultaneously in unscrambled format to the customer's TV(s) and VCR(s). Broadband descrambling thus would be "consumer friendly" because TVs and VCRs would have simultaneous access to all channels in unscrambled format. In turn, TVs and VCRs could perform all of their advanced features such as time shifting, PIP, and Multiple Picture Scan without using multiple cable boxes. This capability is extremely important for consumers because there is a huge installed base of TVs and VCRs with tuners that receive cable frequencies. Indeed, in the last three years alone, Sony estimates that, since 1989, consumers have invested in excess of $30 billion in new TVs and VCRs, virtually all of which have tuners capable of tuning

scrambling the channel(s) in question. Additionally, multichannel descrambling should allow cable operators to change scrambling techniques if the existing techniques become compromised.

C. Standards for Digital Transmission Should be Developed in Order to Avoid Recreating the "Set Top Box" Compatibility Problem in the Digital Era.

As has been widely reported in the media, many cable operators are planning to begin digital transmission on their cable systems as early as 1994. Digital compression and transmission will allow more channels and new services to be provided to consumers. While the benefits are clear, the danger is that in the absence of standards, the move to digital transmission will result in an entirely new generation of set-top boxes, recreating the compatibility problem we are seeking to solve. In contrast, nationwide consensus on standards would enable consumer electronics manufacturers to build digital "tuners," decompressors, descrambling and addressability capabilities directly into TVs and VCRs, creating the most "seamless" interface between new TV and VCR features and cable systems. See infra.

Although it is probably impractical to reach a consensus on national standards for scrambling in the current analog environment, there is still an opportunity to agree on standards for the digital world of the future. In that regard,